DOCUMENT RESUME

ED 210 551 CE 030 861

AUTHOR Bruns, Loren
TITLE Wisconsin's Technical School of the Air.
PUB DATE [Dec 81]
NOTE 21p.; Paper presented ath the Annual Conference of the American Vocational Association (Atlanta, GA, December 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Education; Broadcast Television; Cable Television; *Competency Based Education; Educational Television; Electricity; Instructional Materials; *Material Development; Postsecondary Education; Public Television; Secondary Education; Technical Education; *Telecourses; *Television; *Vocational Education
IDENTIFIERS *Technical School of the Air; *Wisconsin

ABSTRACT

The Technical Scoool of the Air was developed to deliver video-based courses via boradcast and cable television. The system was designed to implement competency-based instructional courses and programs statewide. An audio visual material production consortium was established to facilitate joint production/acquisition efforts, reduce duplicate production, and increase course quality. Materials in Basic Electricity and AC-DC circuits were first developed and broadcast on educational television. Although the project focus had been postsecondary, Wisconsin high school districts requested and received permission for taping programs off the air for future use. Four courses have been produced or acquired and used in broadcast. Over 3000 students have enrolled in these courses via open broadcast and cablecast. The system has been effective in reaching previously unserved adults and is extremely cost effective from an acquisition/production perspective. It also provides programming software needed to experiment with alternative and innovative delivery systems. Planned activities focus on course identification and purchase, establishment of additional co-production and -funding agreements with other agencies, national distribution of materials, and solicitation of funds. (Appendixes include brochures on the video courses available.) (YLB)

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WISCONSIN'S
TECHNICAL SCHOOL OF THE AIR

By
Loren Brumm

A Television-based System for Delivery of Vocational, Technical and Adult Courses

Something exciting is happening to vocational-technical education in Wisconsin. It is called the Technical School of the Air and its objective is to deliver video-based courses via broadcast and cable television to:

1. general public
2. business and industrial worksites
3. technical institutes
4. high schools
5. other public organizations

During the past 18 months, over 3,000 adult students have directly enrolled in video course offerings on a credit basis; tens of thousands of other students at both the secondary and postsecondary level have used the materials in classrooms throughout the state; and a public audience in the hundreds of thousands has seen the programs through public broadcast.

The development of this television based delivery system has been a cooperative venture of the following agencies and organizations.

The Wisconsin Board of Vocational, Technical and Adult Education (VTAE). This is the state level governing agency for the Wisconsin two year postsecondary vocational, technical and adult educational system. The system is composed of 16 VTAE districts that operate 34 technical institute campuses and 350 outreach learning centers. (See attached map.)

The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc. (Foundation). This is a 501(c)(3) tax exempt, non-stock, nonprofit corporation organized under Wisconsin statutes for the purposes of soliciting gifts, grants, bequests and other things of value for the benefit of the vocational, technical and adult educational system.

The Wisconsin Educational Communications Board (ECB). This is the state agency responsible for the operation of the Wisconsin Educational Television Network (see attached map).

The Governor's Employment and Training Office and the Comprehensive Employment and Training Act-Balance of State Prime Sponsor. These are the state agencies partially responsible for CETA funded training programs in Wisconsin.

While the development of the system has been primarily a project effort of the Wisconsin Board of VTAE and the Foundation, CETA agencies and the ECB have been cooperatively involved in various phases of the project and have been instrumental in its success.

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Because we have only limited time available we will focus our discussion of Wisconsin's television based system for delivery of vocational-technical courses on four general questions:

1. Why develop such a system?
2. How does the system work?
3. How effective has the system been?
4. What lies ahead?

Why develop such a system?

Over the past few years a number of things have been happening simultaneously in Wisconsin that have contributed to the development of our system.

A. The method of instruction in the Wisconsin Vocational, Technical and Adult Education districts has been changing to a more individualized competency based format. Implementation of a competency based instructional system, requires quality video-based instructional materials.

B. Cable television systems have been expanding at a very rapid pace and dedicated channels have been provided to technical institutes and other educational institutions. This greatly stimulated the interest of our technical institutes in delivering courses to the general adult population as well as to specific business and industrial client groups via cable.

C. Wisconsin has an educational television system that covers the state. This system had not been fully utilized by vocational, technical and adult education. The State Board of VTAE, VTAE districts and CETA agencies were interested in learning whether this television system might not be an effective way of reaching disadvantaged and CETA eligible populations.

All of these things contributed to the development of our system because they were all linked by one common problem. That problem was the lack of quality video-based vocational technical courses. Few courses were available commercially and those courses that were available were very expensive. This lack of video based materials was inhibiting our ability to implement competency based instructional programs as well as our ability to deliver courses directly via broadcast and cable.

Individual technical institutes were attempting to overcome this problem by separately producing their own video materials. However, in having to produce separately the materials for many program areas, they were not only duplicating each others efforts, but their production resources were spread so thin that production quality was not sufficiently high for the materials to be generally accepted by others for use either as competency based classroom supplementary materials nor for use in cable or broadcast. This duplication of effort was also a problem.

The idea that began to take shape as a result of all this was that if this fundamental problem of a lack of quality video materials could be addressed, a system could be developed that would provide for the statewide delivery of the courses via broadcast and cable television. These courses could then be used for multiple purposes including direct enrollment of adult students via broadcast, classroom supplements, and on-site delivery to business and industry.

How does the system work?

Before we could begin to develop a system, we had to attempt to solve the first problem by providing a mechanism for the cooperative production and/or acquisition of quality video-based materials. Unfortunately, funds for experimental projects are usually difficult to find and this project was no exception. We needed seed money to demonstrate the potential of the project idea and therefore the Foundation in 1979 submitted a proposal to the Fund for Improvement of Postsecondary Education (FIPSE). Fortunately, the project was favorably reviewed and subsequently funded for a three year period beginning with FY 1979.

It enabled the Wisconsin VTAE system to establish an audio visual materials production consortium. The consortium was established through an informal agreement between the 16 Wisconsin VTAE districts, the Wisconsin Board of Vocational, Technical and Adult Education, and the Foundation. The consortium provided an organizational structure through which the 16 VTAE Districts could jointly identify, plan, produce, fund and/or acquire mutually needed audio visual instructional materials. The consortium is still operating and consists of one representative of each VTAE district and a representative of the state board. In addition, through the consortium ad hoc committees composed of content experts are brought together as needed to review specific production or acquisition proposals. The Foundation provides administrative and staff support for the consortium group.

The consortium structure has been very successful in facilitating joint production/acquisition efforts and thus has helped reduce duplicate production and has helped increase the quality of the courses produced. It has also reduced the cost of courses acquired from commercial vendors. Included among the initial productions/acquisitions were video-based courses in "Basic Electricity and DC Circuits," "Basic AC Circuits," Introduction to Marketing," and "General Education Development."

It should be specifically noted that the seed money provided by FIPSE for these efforts was the catalyst needed to stimulate and focus the interest of many people in developing a television-based delivery system. As an example, because the issue of course production/acquisition was being addressed through the FIPSE project, a need to address the second problem of delivery of courses was recognized. Therefore a cooperative project was funded by state CETA and Vocational Education agencies to provide for the instructional coordination and statewide delivery of these courses over the Wisconsin Education Television Network. This project provided funds for a position of educational T.V. coordinator within the Wisconsin Board of VTAE and funds for statewide promotion of courses, as well as some funding for program production and acquistion.

The system that has developed while evolutionary and still evolving, is one in which the Foundation is primarily involved in soliciting resources for and coordinating activities related to acquisition and production of courses; the Wisconsin Board of VTAE is involved in the coordination of course delivery; and VTAE districts are involved in the direct delivery and use of the courses. These areas are of course not rigid in that the entire system depends upon mutual support and cooperation. As an example, while the Foundation is primarily responsible for facilitating production/acquisition, decisions on what to produce or acquire are made cooperatively by all involved. Similarly while the Foundation facilitates funding, funding is usually a cooperative effort involving VTAE districts, the Foundation, the Board, as well as other organizations.

The question asked most often about this structure is why the Foundation has assumed a lead role in course production/acquisition. This has happened for two primary reasons.

1. Production or acquistion of quality video-based courses is very expensive and we hoped to be able to attract funds from business, industry and other private organizations for certain production or acquisition efforts. As a 501(c)(3) tax exempt organization, the Foundation is able to solicite funds for production or acquisition from private sector organizations more easily than a tax supported organization.

2. Because production of quality courses is very expensive, and because we felt the materials could probably also be used in other places, we wanted to distribute the materials nationally. It was thought that national distribution would help us recover a portion of our production costs as well as help us identify other organizations with whom we might jointly produce other materials. The Foundation was in the best position to begin such a distribution effort on materials produced.

An understanding of the way the system actually works can best be provided if we use our first video series production/acquisition project "Basic Electricity and DC Circuits" and "Basic AC Circuits" as an example. This series is a fully integrated video print instructional package. Each course consists of 30 video tapes, a textbook, and a lab manual. The development of this series was a cooperative project between the Wisconsin Foundation and VTAE system, and Texas Instruments Inc. (TI) of Dallas, Texas.

When our A/V production consortium was first organized, a priority need for video-based materials in Basic Electricity and AC-DC Circuits was identified. Because it is always less expensive to acquire than to produce materials, a search was then initiated to attempt to identify available materials in this area. A course in "Basic Electricity and DC Circuits" was found to be available through TI. After extensive review of the DC course by the Wisconsin Audio Visual Production Consortium and content experts from various VTAE districts, the decision was made to try to work out an agreement with TI for the cooperative production of a companion AC course and thus provide for completion of the series that we needed. After extensive negotiation, an acceptable agreement with TI was reached in June of 1980. The agreement called for the cooperative

production of a "Basic AC Circuits" course. The Wisconsin Foundation for VTAE, Inc. agreed to fund the production of the video component of the AC course and TI agreed to fund the development of the print package for the AC course. The Foundation solicited the money needed to fund this project from a variety of sources. The agreement also provided Wisconsin with usage and distribution rights for the DC course. The "Basic AC Circuits" course, copyrighted by the Foundation, was completed in May 1981.

Soon after the contract was signed, a 3/4" set of the DC course was provided to each VTAE district, and upon completion of the AC course, a 3/4" set of this course was also provided to each VTAE district. Along with the tapes, districts were also given the right to copy and use the courses in broadcast, non-broadcast and cable.

Soon after copies of the courses were provided to the districts, a broadcast master copy of each course was given by the Foundation to the educational television coordinator at the Wisconsin Board of VTAE for statewide broadcast. The DC course was broadcast statewide for the first time during the spring semester of 1981 and both courses were broadcast statewide in the fall of 1981. The statewide educational T.V. coordinator worked with the VTAE districts who wished to enroll students in open broadcast by:

1. Working with the Wisconsin Educational Television Network in coordinating statewide broadcast schedules;

2. Coordinating statewide promotion and printing of brochures and posters;

3. Conducting statewide educational television workshops;

4. Acting in a general coordinative capacity to solve any problems that arose during the course of the broadcast;

5. Collecting information on enrolled students.

While the Wisconsin Board of VTAE coordinates delivery and provides services to the VTAE districts that wish to take part in the direct broadcast delivery system, the individual VTAE districts are responsible for enrolling and providing instructional support to enrolled students. Since spring of 1981, eight districts have enrolled over 300 students in the AC-DC series via open broadcast.

The educational television coordinator also works with high schools, and other organizations (e.g. prisons and community based organizations) that may want to use the materials. Information is provided on broadcast schedules, off-air taping rights etc.

As an example, the first DC broadcast during spring of 1981 generated widespread interest on the part of high schools in using the DC course. Many calls were received by high schools who wanted permission to tape the materials off the air. Until this time the focus of the project had been primarily postsecondary-adult. While the use of the materials by high schools had been anticipated we

had not been actively working with high schools nor with the Department of Public Instruction (DPI) the state level governing agency for the elementary and secondary educational system.

However, as a result of this interest, in cooperation with DPI, during May of 1981, all Wisconsin high school districts were notified that both courses would be broadcast during the fall of 1981 and that they could tape the materials off the air without charge. At this time over 50 high schools are using copies of the courses. In all over 150 sets of both courses are in use in Wisconsin. We expect that utilization will continue to increase as news of the availability of the courses spreads.

Because of this interest, we are now planning to involve the secondary system in future efforts in the same manner as we have done with AC-DC. High schools will be notified through DPI of programs being broadcast and authorized to tape programs off the air for future use. We will probably also involve DPI and high schools in the acquisition/production and funding process as well.

Broadcast thus serves two very important purposes:

1. It delivers the courses to end users, e.g. the general public or business and industry employees at work sites who can enroll through a postsecondary Technical Institute.

2. It delivers the courses to 437 high schools, 34 technical institute campuses as well as to other public organizations for off-air dubbing and reuse.

After copies have been made off-air or acquired by local educational agencies they can be used in a variety of ways.

A. Local rebroadcast or cablecast for enrollment by the general public or specific user groups.

B. As competency based supplements to classroom instruction.

C. In resource centers and libraries as individualized learning packages.

D. On site placement at business and industrial locations.

How effective has the system been?

It is impossible to make a comprehensive assessment of how effective the system has been in that the system has only recently begun operation and information on utilization of materials is incomplete. In addition, the benefits from our efforts will be continuing for years to come. However, based upon currently available information we can provide some rather interesting statistics on the effectiveness and benefits of the system.

1. In the past 18 months four courses have been jointly produced or acquired by the VTAE system and used in broadcast.

"Basic Electricity and DC Circuits"
"Basic AC Circuits"
"Marketing Perspectives - An Introduction to Marketing"
A "General Educational Development" Course

2. Over 3,000 students have enrolled directly in these courses via open broadcast and cablecast.

3. Via open broadcast and cablecast we are reaching large numbers of adults not previously served by the Wisconsin VTAE system. Persons who because of distance, family or work responsibilities, lack of confidence etc. would or could not take a course on campus. Depending upon the course, between 1/3 and 2/3 of students enrolled via open broadcast had never taken any course at any of our schools before. In one district when 90 television students were asked if there was anything that would prevent them from taking a course on campus, 61% said "yes" citing the reasons noted above. Many of these students are interested in further education and may well become on campus students.

4. There are tremendous public relations benefits to be derived from a television delivery system. Helping adults, who did not previously have access to our schools, get a high school equivalency diploma or providing a course in basic electricity to a group of workers at their place of employment is a great way to build the image of a school. As an example, after a recent GED broadcast, a commercial television station opened a special feature report on the evening news as follows: "Bob and Sue both dropped out of high school at age 17 to get married. That was three years ago. Bob has been working two jobs ever since. Sue has been busy caring for their two children. Although they always wanted to obtain their high school equivalency diplomas, neither could find the time to go to school - until last year when they both enrolled in a television GED program sponsored by Northeast Wisconsin Technical Institute." The program went on to interview the two students and to praise the school for its television delivery program.

5. The system is very effective in delivering courses to widely dispersed educational institutions, e.g. over 150 sets of both the AC and DC courses are now in use by secondary and postsecondary institutions. Many of these sets were taped off the air.

6. The system is extremely cost effective from an acquisition/production perspective. Bringing multiple districts or organizations together to jointly produce courses eliminates the need for duplicate production and increases course quality. This not only saves money but also allows the resultant product to be sold and thus some or all of production costs to be recovered. Statewide acquisition of courses commercially available can also provide great savings. As an example of these savings, if each Wisconsin educational institution that is now using the AC-DC series purchased the series individually, it would have cost them $500,000 more than the amount that we invested in the total project. As use of the series increases, this savings will continue to grow.

7. The system provides programming software needed to experiment with alternative and innovative delivery systems like on-site delivery at business and industrial locations, ITFS, interactive computer video, cable etc. These alternatives can be very effective if properly implemented. As an example, one VTAE district has enrolled over 100 students in the AC-DC series since last May via on-site placement of tapes at business and industrial locations.

What lies ahead?

There is a revolution sweeping the communications industry that some people are comparing to the industrial revolution. The most visible manifestation of this revolution is the rate at which America is becoming wired for cable. Today 21 million or 26% of the nation's homes are wired for cable. New subscribers are becoming wired at a rate of 250,000 a month and it is estimated that the number of wired households could reach 40 million or more by 1990. Cable systems now being installed with 50 or more channels are common. In many instances educational institutions have access to one or more of these channels.

This growth of cable television along with other changes such as the widespread use of home video tape/disk players and home computers, the development of interactive video/computer instructional systems, the possibility of direct satellite delivery of programs etc. are going to have a tremendous impact on educational program delivery.

We are in the communications business and technological changes are providing incredible new and expanding vehicles for communicating with our students. In Wisconsin we are attempting to deal with these new opportunities by focusing upon what we see as the major obstacle that prevents us from using the vehicle most effectively - lack of video-based software. Without this video software, none of these new communications vehicles can be effectively used.

While we are pleased with our initial acquisition/production efforts, we have great need for additional video based instructional materials. Included among the courses that we are interested in producing or acquiring are "Introduction to Manufacturing Processes," "Applied Algebra," "Trigonometry," "Machine Tool Operation," "Introduction to Retailing," "Introduction to Food Service," "Introduction to Microprocessors," "Introduction to Computers," "Introduction to Solid State Electronics," and "Introduction to Digital Electronics." This list is by no means exhaustive.

In order to facilitate these production/acquisition efforts, during the next year we will be focusing upon four general activities.

1. Identification and purchase of appropriate courses available through public or private organizations.

2. Establishment of co-production and co-funding agreements with other public and private agencies for the production of other courses.

3. National distribution of materials produced in an effort to build a revolving fund for additional production.

4. Solicitation of funds from public and private organizations for support of production or acquisition activities.

Additional information can be obtained from:

Ms. Sandy Carman
Educational T.V. Coordinator
Wisconsin Board of VTAE
P. O. Box 7874
Madison, Wisconsin 53707
(608)266-6764

Mr. Doyle Beyl, Director
Bureau of Research, Professional
and Student Development
Wisconsin Board of VTAE
P. O. Box 7874
Madison, Wisconsin 53707
(608)266-0001

Mr. Loren Brumm
Grants Officer
Wisconsin Board of VTAE
P. O. Box 7874
Madison, Wisconsin 53707
(608)266-2318

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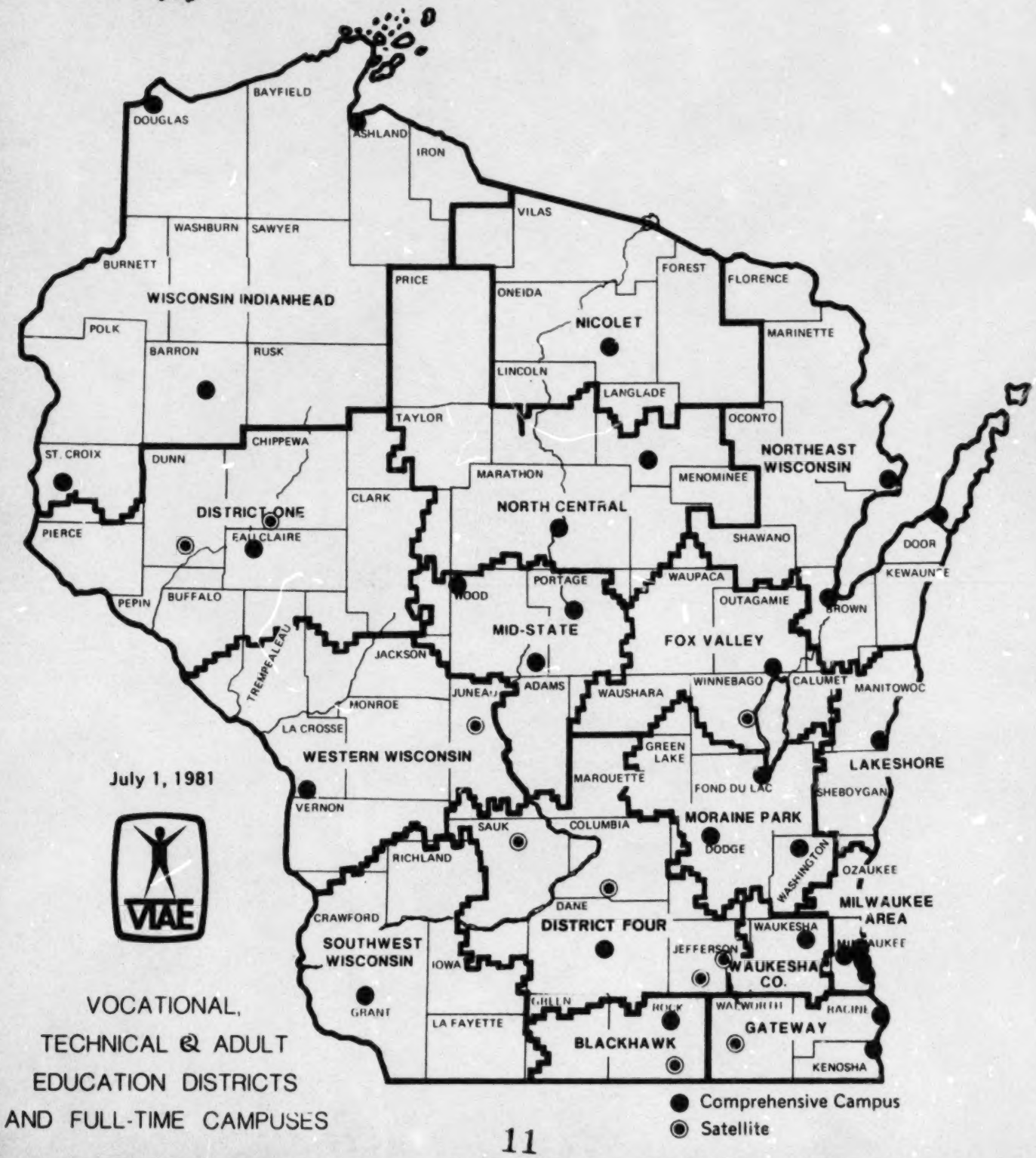

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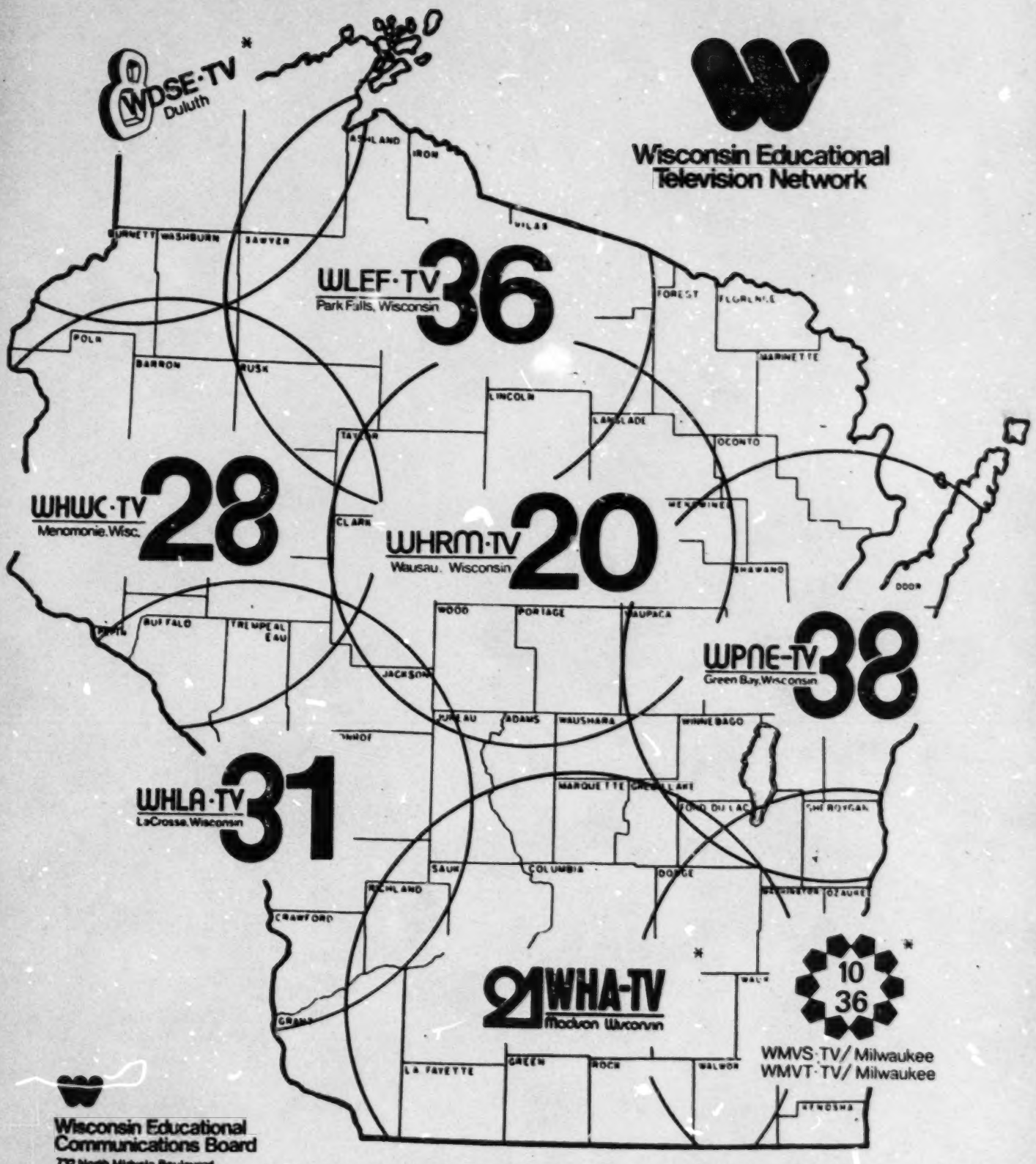
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Madison, Wisconsin 53705
Phone (608) 265-0336
* NETWORK AFFILIATE

Grandmother earns high school diploma

By GRANT BLUM

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VIOLA, Wis.— Effie Johnson, 64, waited 49 years to get her high school diploma.

Her driver's license is next, and then it's off to a hoped-for career as a nurses aide in a hospital or nursing home.

In June, Mrs. Johnson completed a televised high school diploma equivalency course through Southwest Technical Institute at Fennimore. It was her first schooling since she dropped out of Viroqua High School in 1931 at the end of the ninth grade. During the next 49 years, Mrs. Johnson, whose maiden name was Mossholder, was married three times, widowed twice, and became the mother of seven children and grandmother of 18.

Mrs. Johnson says she had always thought about getting a diploma. Her chance came last fall. During a visit to the Viola Public Library, she spotted literature on the high school equivalency program. "On the spur of the moment, I thought I'd try this," she says.

Now, sitting in the living room of the 1½-story frame home where she has lived for 16 years, Mrs. Johnson looks to the future and talks of the past.

"I'm proud of this," she says, holding the framed certificate in her hand. It is dated June 20.

She recalls the lectures on WHLA—TV (Channel 31) in science, social science, English, mathematics and reading. "It was so funny. I didn't care much for science and I had my highest grade in science."

Ellsen Schoville photo

Effie Johnson of Viola proudly displays her high school diploma earned this spring through a televised high school equivalency course.

At one point workmen were remodeling her home, a project to be paid for with a federal Housing & Urban Development loan which becomes a grant if she stays in the home three years. "I'd sit right here and do my studies," she says. All her studies were through television. Several times she phoned instructors at Fennimore for help, as the system provides for.

Then, after two days of examinations and five tests, she passed and received her certificate.

The Depression had ended Mrs. Johnson's schooling at age 15. She says because there was no school bus transportation in those years, high school students had to board in town.

"You either had to find a job or have your folks help you," she says. For her ninth-grade year, she shared a room with a brother and sister who also were attending Viroqua High School.

But her parents had no money to help her and Mrs. Johnson couldn't get financial help from relatives, as the other two did. So she had to drop out.

"Kids simply can't realize how easy they have it for an education if they care to accept it," Mrs. Johnson says.

After leaving school, Mrs. Johnson worked for several years, primarily doing housekeeping or farm work on various farms. "I picked strawberries, washed dairy barn utensils, and mowed the lawn." She received 50 cents a day.

Mrs. Johnson married in 1934, but the marriage did not last. In 1941, she remarried but her second husband

(cont. from pg. 1)

drowned five years later. In 1948, she married again. Her third husband died five years ago.

Mrs. Johnson has done a variety of jobs over the years to earn a living. For 20 years, she was a waitress at cafes in Viola and Viroqua. She also does painting and wallpapering in homes, has a large garden and cans fruit and vegetables.

"I stretch a dollar until it hollers," Mrs. Johnson says. She has to because her income, other than painting and wallpapering, consists of $278 a month in Social Security and a $42-a-month pension she gets because her last husband was a veteran.

Last year, Mrs. Johnson took an adult driver education course at Viola High School. This year, one son gave her an old car that another son is fixing up.

She has a learner's permit and plans to take her driver's test after practicing her driving.

Then, she plans to enroll in a nurse's aide program.

Meanwhile, Mrs. Johnson is putting the finishing touches on her home improvements, which include a remodeled kitchen and the home's first indoor plumbing. Pointing to a little building on the edge of the lot where her home stands, Mrs. Johnson quips, "I had my house on the prairie."

There is painting to be done. "I'm going to try to stir my son on some of this, but if he doesn't, I'll do it myself," she laughs. "I'll be a carpenter and make steps for my cellar. Then I'll hang a cellar door. I know how to use a hammer."

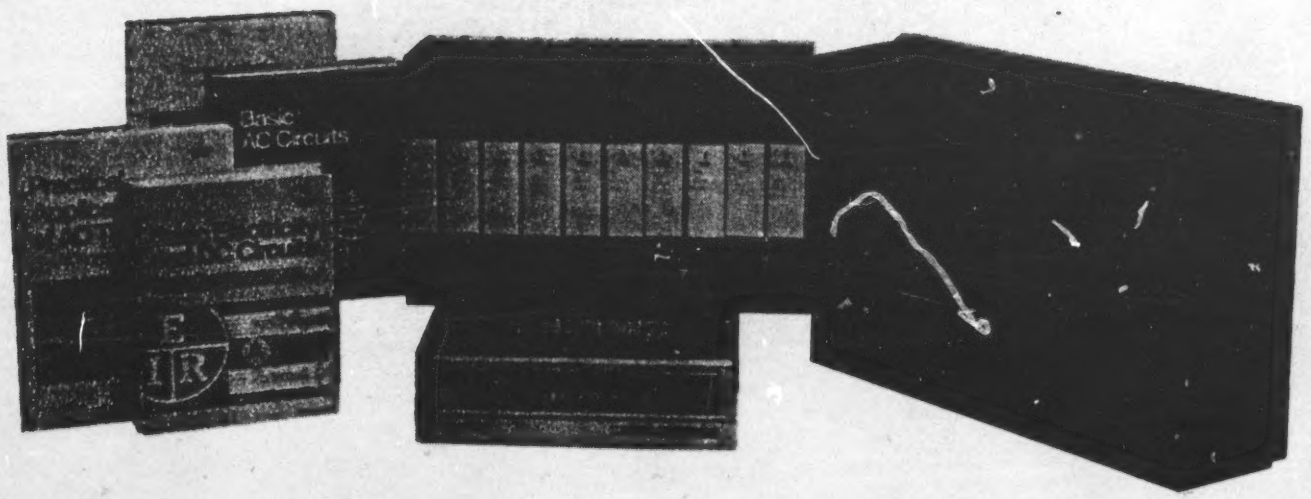
Mrs. Johnson got a present Friday. Her son Bruce, who lives in a mobile home next door, came over with a boquet of roses.

Asked if it was to celebrate his mother's diploma, Bruce nodded and quickly added, "There doesn't have to be any occasion."

The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc.

is pleased to announce the availability of a

NEW FULLY INTEGRATED VIDEO-PRINT INSTRUCTIONAL SERIES IN BASIC ELECTRICITY AND AC-DC CIRCUITS



These competency-based video courses, one in DC and one in AC Circuits, were designed for people with no previous training in electronics. They were originally developed for use in Associate Degree Electronics programs, but are suitable for use in any educational program where a basic understanding of electricity is required. These high quality video instructional materials have broad-based educational value and can be used in a variety of ways:

- public broadcast over educational television;
- cablecast to specific subscriber populations;
- in the classroom as supplements to traditional instruction;
- in libraries as individualized learning packages or independent study programs;
- on-site as part of business or industrial training programs.

The DC video course was produced by Texas Instruments of Dallas, Texas. The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc. recently acquired a license to distribute this course worldwide. This license is part of an overall agreement with Texas Instruments which provided for the cooperative production of the recently completed AC Circuits video course.

This unique agreement has made it posaible for the Foundation to offer these video courses to all users at a very reasonable price. We would be pleased to discuss the various ways in which these materials can be used and any usage rights in which you may be interested.

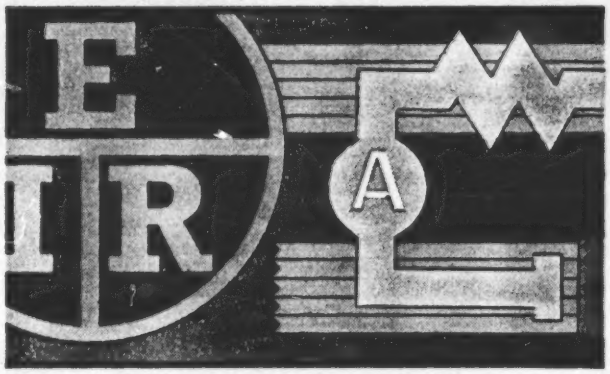
THE VIDEO COURSES

Each course is a fully-integrated video-print package consisting of:

- 30 videotape programs (lecture sessions and laboratory exercises);
- a companion textbook;
- a laboratory manual.

The videotape lessons, supplemented by the laboratory exercises, teach students to analyze and control electricity and accurately predict its behavior with simple circuit laws. Students learn the fundamental concepts, laws and terminology and familiarize themselves with the mathematical tools, test equipment, laboratory procedures and components necessary to function and advance within this pervasive technical field.

"Basic Electricity and AC-DC Circuits" allows instructors new freedom in course construction and delivery, providing an opportunity to accommodate special student needs and time schedules. These video-based instructional materials form an extremely practical training package, which communicates AC-DC fundamentals quickly and efficiently.



BASIC ELECTRICITY AND DC CIRCUITS

An Introduction to Electricity
Examines origins and definitions of electricity including atom structure and first law of electrostatics. Describes the role of free electrons, shell structure, valence and ions. Introduces the concept of the electrical circuit.

Voltage, Current and Resistance
Analyzes voltage, current and resistance in detail. Explains schematic diagrams. Covers resistance and resistors, including factors determining resistance of a conductor, resistor color codes and voltage ratings.

Scientific Notation and Metric Prefixes
Introduces a simple "metric chart" to help students master number conversions from decimal form to scientific notation and metric prefixed format, or vice versa. Discusses addition, subtraction, multiplication and division of numbers written in scientific notation.

Ohm's Law and Power
Applies Ohm's law to predict voltage, current and resistance behavior in very simple circuits. Concept of power dissipation, plus the mathematics of squares and square roots, allows students to calculate resistive power loss.

Series Circuits
Surveys series circuits and the rules governing their behavior. Students learn to identify series circuits and calculate their equivalent resistance, the current flowing in them, voltages appearing at various points in the circuit and the power dissipated by each resistor.

Introduction to Parallel Circuits
Defines the three basic laws governing the behavior of voltage, current and resistance in parallel circuits. Includes full discussion of resistance in parallel—conductance, reciprocal formula for resistance, product over sum formula and rules for combining identical resistors in parallel.

Parallel Circuits Analysis
Outlines circuit analysis of parallel circuits including procedures for calculating unknown voltages, currents and resistances in any part of a simple parallel circuit. Covers differences between series and parallel circuits for predicting circuit behavior.

Parallel-Series Circuits
Reviews behavior rules for series and parallel circuits. Introduces series-parallel and parallel-series circuits with an in-depth parallel-series circuit analysis. Includes step-by-step explanation of the process of circuit reduction.

Series-Parallel Circuits
Discusses the application of circuit reduction techniques and Ohm's law to more complex, single-supply series-parallel circuits. Practical "circuit sense" methods are introduced to help students analyze circuit schematics.

Voltage Dividers and Power
Provides additional analysis involving Ohm's law and circuit reduction techniques. Describes basic concepts for designing voltage divider circuits with positive or negative outputs. Expands basic formulas used in calculating power dissipation in circuits involving voltage dividers.

Introduction to Kirchhoff's Laws
Covers Kirchhoff's voltage and current laws, then presents the terminology and mathematical concepts necessary to use these laws in circuit analysis. Includes circuit analysis using both conventional and electron current flow.

Advanced Methods of D.C. Circuit Analysis
Extends Kirchhoff's laws to more complex circuit situations. Introduces the superposition theorem and its use in multiple-source D.C. circuit analysis. Other advanced circuit analysis techniques include mesh-current and node-voltage analysis, plus Thevenin's, Norton's and Mullman's theorems.

Capacitors and the RC Time Constant
Examines capacitor construction, units of capacitance measurement, charging and discharging, typical applications. Describes RC time constant and the universal time constant graph. Analyzes the effects of capacitor charge storage and rapid discharge.

Inductors and the L/R Time Constant
Surveys coils as circuit components and discusses the storage and release of energy from the magnetic field around the coil. Explains concept of L/R time constant. Demonstrates high-voltage sparking phenomena.

BASIC AC CIRCUITS

Introduction to Alternating Current
Alternating current (AC) is defined and compared to direct current (DC), and the operation of an AC generator is discussed. Time, frequency and cyclic characteristics of the AC waveform are analyzed with examples provided for each concept.

AC and the Sine Wave
Discusses in detail the amplitude descriptions of a sinusoidal waveform. Also, the time and frequency measurement of a waveform are reviewed, and an introduction to the trigonometric function is presented.

The Oscilloscope and Its Use
One of the most important electronic measuring instruments for AC voltages and currents is discussed—the oscilloscope. It is particularly important because it allows one to "take" an electronic picture of AC waveforms. The construction of an oscilloscope is explained. The function and adjustment of an oscilloscope's controls are described. Explanation is given as to how to use an oscilloscope to perform some electrical measurements.

The Sine Wave and Phase
The use of the sine function to determine instantaneous voltage and current values of a sine wave is discussed. The relationship between the period of a sinusoidal waveform and the electrical degrees of a cycle is described. The radian as a unit of angular measure is introduced. It is explained how to determine and specify the phase relationship of sinusoidal waveforms and the use of phasor notation is described.

Resistive Circuits
Provides a more detailed investigation of actual circuits with an AC voltage applied. Describes how to determine voltages and current in series, parallel, and series-parallel resistive circuits when an AC voltage is applied. Peak, peak-to-peak, and rms voltage, current and power values are calculated. The phase and frequency of circuit current and component voltages in AC resistive circuits are analyzed.

Capacitance
The electrical property of capacitance and another electronic circuit component, the capacitor, are introduced. The physical and electrical properties of capacitors are discussed. Series and parallel capacitive AC circuits are described and analyzed. The capacitor and the effects of capacitive action in AC series and parallel circuits are described.

RC Circuit Analysis
Discusses AC circuits in which capacitors and resistors are combined in series and parallel. Phasor diagrams are developed for both types of circuits. Ohm's law and the Pythagorean theorem are used to calculate the various circuit values.

Inductance and Transformers
Introduces the inductor and transformer with a discussion of their physical and electrical properties. Circuits containing series and parallel-connected inductors are discussed and analyzed. The property of mutual inductance is introduced.

RL Circuit Analysis
Methods of analysis of series and parallel circuits containing resistors and inductors are discussed.

RC and RL Time Constants
Discusses the time relationships of current and voltage in DC resistive and capacitive, and resistive and inductive circuits. A special quantity, a time constant, is introduced and RC and RL time constants are defined. Voltages and currents are calculated after various time intervals of circuit operation.

RLC Circuit Analysis
Series and parallel circuits with resistors, capacitors, and inductors are analyzed. Many of the same techniques used in the solution of resistive-capacitive and resistive-inductive circuits are used in this analysis. Phasor diagrams provide descriptions of the circuits that lead to Pythagorean theorem solutions of certain circuit values.

Phasor Algebra
Provides an introduction to phasor algebra by introducing the use of the j-operator and its application to the solution of simple RL and RC circuits. Both rectangular and polar coordinate representations of circuit impedance are presented as well as the methods of conversion from one form to the other.

Complex RLC Circuit Analysis
Imaginary numbers, complex numbers, and the j-operator are applied to solve RLC circuits which would be very difficult to solve using other methods.

Resonance
The property of resonance is introduced. Its effects on the impedance, currents, and voltages of a circuit are examined. The response of RLC circuits to frequency response of a circuit is investigated. The Q, or quality factor of a circuit, and its interaction with frequency response is discussed.

PREVIEW INFORMATION

The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc. would be pleased to send you a preview package for a limited period of time.

Please fill out the form on the reverse side and mail to:

Barry Mirkin
Director of Resource Development
Wisconsin Foundation for Vocational,
Technical and Adult Education Inc.
5402 Mineral Point Road
Madison, Wisconsin 53705

LABORATORY SESSIONS
(vary from approximately 12-24 minutes)

DC CIRCUITS

1. Laboratory Safety
2. The Ohmeter and its use
3. Interpreting the Resistor Color Code
4. The Voltmeter and its use
5. The Ammeter and its use
6. Ohm's Law and Series Circuits
7. Parallel Resistances
8. Parallel Circuits & Their Analysis
9. The Mechanical Switch
10. Series-Parallel Circuits
11. Voltage Dividers with Parallel Branch Currents
12. Network Analysis with Multiple Voltage Sources
13. The Wheatstone Bridge
14. RC Time Constants
15. L/R Time Constants

AC CIRCUITS

1. Oscilloscope Calibration and Use
2. Oscilloscope Input Coupling and Waveform Analysis
3. Oscilloscope Triggering
4. Resistive Circuit Analysis
5. Series RC Circuits
6. Parallel RC Circuits
7. Transformers
8. Series RL Circuits
9. Parallel RL Circuits
10. RC Time Constants
11. RL Time Constants
12. Series Resistive and Reactive Circuits
13. Parallel Resistive and Reactive Circuits
14. Resonance
15. Introduction to Safety in the Lab

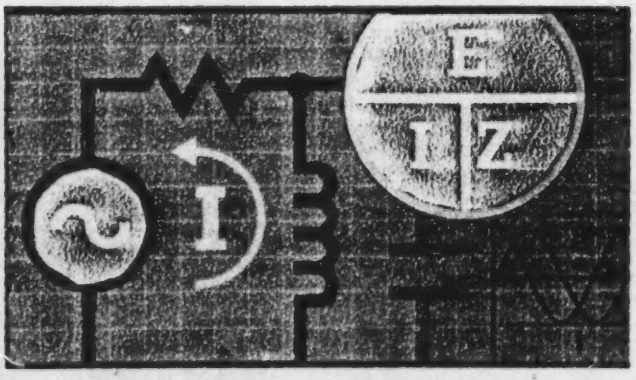
PRICE INFORMATION

- AC or DC Video Course (30 programs each)
  Foundation furnished tape
  (¾", VHS, or BETA) $3,990.00
  Dubbed onto customer tape at customer facility.. $3,390.00
- Either course may be purchased on a 3 year lease-purchase plan for $1,500/yr. A low cost 5 year straight lease plan is also available.
- Rights to use in broadcast or cablecast are available for a small additional fee.
- Educational Consortium or statewide lease or purchase prices will be provided upon request.

Textbooks:
Basic Electricity and DC Circuits or ***Basic AC Circuits***
Suggested Retail Price $20.00
Resale Price $12.00

Lab Manual:
Practical Application of DC Theory or ***Practical Application of AC Theory***
Suggested Retail Price $12.00
Resale Price ..... $ 7.20

All prices subject to change without notice.



For additional information contact:

Loren Brumm
(608) 266-2318
OR
Barry Mirkin
(608) 231-3626
Wisconsin Foundation for VTAE, Inc.
5402 Mineral Point Road
Madison, Wisconsin 53705

PREVIEW REQUEST FORM

I am interested in your fully integrated video-print instructional materials. Please send me a preview package for:

☐ "Basic Electricity and DC Circuits" ☐ "Basic AC Circuits" ☐ Both courses

Name _____

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Institution _____

Address _____

City _____ State _____ Zip _____

Signature _____

The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc.

is pleased to announce the availability of a

NEW COMPETENCY-BASED VIDEO-PRINT INSTRUCTIONAL SERIES IN MARKETING PERSPECTIVES

This competency-based video course was produced by the Milwaukee Area Technical College and designed as an introduction to Marketing for students in Associate Degree Business programs. Because the course emphasizes the fundamentals of marketing and the profitable operation of a business enterprise, it is suitable for use in any educational program where a basic, yet thorough, understanding of marketing is required. Special attention is given to the role and significance of middlemen, evaluation of consumer needs, price determination, promotion, sales strategy and government regulations. The complete video-print instructional package consists of: 30 videotape programs, each 30 minutes in length; an integrated study guide; and a textbook.

These high quality video instructional materials have broad-based educational value and can be used in a variety of ways:

- in the classroom as supplements to traditional instruction;
- in libraries as individualized learning packages or independent study programs;
- on-site as part of business training programs;
- public broadcast over educational television;
- cablecast to specific subscriber populations.

The Wisconsin Foundation for Vocational, Technical and Adult Education, Inc. is the licensed worldwide distributor for this video course. Staff would be pleased to discuss the various ways in which these materials can be used and any variety of usage rights that your organization may need.

Marketing Perspectives Program Descriptions

Marketing Today

Benefits of marketing in the U.S. economic system and to the individual firm; marketing functions; differentiation between marketing and selling; marketing costs as part of the retail selling price; understanding the marketing concept and definition of the term "marketing."

Marketing Variables

Definition of the term "marketing mix;" controlling variables in the marketing mix; external factors which effect the marketing mix; adjustment of marketing mixes to reflect change in the marketplace; factors which increase international marketing.

Target Markets

Explanation of the term "market segmentation;" demographic factors which can be used for segmentation; psychographics and their relationship to the segmentation process; evaluation of market segments as to their potential; the principle of aggregation; use by corporations of multivariate analysis in segmenting the marketplace.

Market Research

Marketing information system and its components; primary and secondary data; traditional methods of information gathering; considerations in completing market research projects; limitations and importance of sampling techniques; test marketing as an information method.

Consumerism

Definition of the term "consumerism;" relationship among consumers, business and government; the role of consumer groups; objectives of the Consumers' Union; advantages to the marketer of consumer education program; growth of the U.S. population and its effect on marketers.

Consumer Buying Behavior

Psychological influences on consumer buying patterns; Maslow's need hierarchy; the consumer lifecycle and its effect on marketing; determinants of the social class structure; emotional and rational reasons for buying decisions; effects of changes in traditional societal roles; the self-concept theory; psychographics and its relationship to demographics; "life-style" oriented marketing in consumer products and its correlation to industrial products; influence of reference groups on the psychological framework of the individual consumer.

Government and Its Influences

The role of government in the U.S. economy; government's role in the purchasing of U.S. goods and services; the changing role of government as a regulator of business; the F.D.A. drug approval process and its impact on marketers; the role of Consumer Product Safety Commission; the cost of product safety in an economic sense; the effects of deregulation on particular industries.

Industrial Markets

The concept of derived demand; factors which influence consumer buying decisions; the role of the purchasing department from a marketing viewpoint; the importance of capital goods to a manufacturer; manufacturers' considerations in purchasing; classifications of industrial products.

Channels of Distribution

Definition of "channels of distribution;" manufacturers' considerations in selecting a channel of distribution; traditional channels of distribution for consumer products; advantages and disadvantages of vertical integration; functions performed by the midchannel members; major factors to be evaluated in changing channels of distribution.

Agents and Brokers

Definition of an agent; function of a realtor; legal relationship between sellers and agents; role of the manufacturing agent; futures markets compared to cash markets for sellers of commodity products; definition of hedging; function of brokerage firms.

Wholesalers and Distributors

Marketing activities performed by wholesalers; importance of merchandise selection by the wholesaler; role of the industrial distributor; differentiation between full-line merchandise wholesalers and rack jobbers; economic justification for the use of wholesalers; limited function wholesalers.

Retailing

Definition of retailing; characteristics of a retail chain; types of retail chain stores; advantages of franchising; advantages of general merchandise chain store operation; comparison of advantages of small single store operations to large chain store operations; horizontal and vertical integration; function of visual merchandising in retail operations; the "wheel of retailing" concept.

Retail Location

Classifications of consumer products based upon purchasing patterns; key criteria in developing a shopping center; advantages and disadvantages of developing a specialty product image; key criteria for success in site selection for small retailers; criteria to be considered in locating a new retail outlet; significance of the downtown redevelopment trend.

Marketing Strategies

Definition of the term "marketing strategy;" process of developing marketing strategies; importance of technological changes on product line management; how the shortage of products affects marketing management.

Product Management

Five stages of the product lifecycle; comparison of the growth curve to the profit-loss curve in the product lifecycle; ways to expand the product line; ways to extend the product's lifecycle; steps in the product adoption sequence; relationship of fashion to the length of a product's lifecycle; breadth and depth of the retail merchandise mix.

Product Development

Primary sources for new product concepts; product development sequence; ways that product introductions affect existing product lines; role of corporate management in product development; venture teams and project center management; effect of need for product safety on product development.

Product Identification

Definition of the term "branding;" importance of branding in product differentiation; advantages of umbrella brands; advantages of generic branding; advantages of national brands vs. private brands; advantages of licensing agreements.

Packaging and Labeling

Role of packaging in the marketing mix; role of shape and function in packaging design; use of packaging as a communications tool; types of labeling.

Physical Distribution

Comparison of the advantages of shipping by air, rail and truck; means to differentiate a common carrier's transportation services from those of competitors; advantages of intermodal freight movements; effects of governmental controls in the transportation industry; concept of physical distribution management; role of freight forwarders.

Marketing Communications

Basic process of communication; sales skills; steps in the sales process; importance of personal motivation to a salesperson; factors to be assessed in establishing sales territories; methods of organizing a sales force.

Advertising—Print

Role of advertising in the marketing mix; major forms of print advertising; advantages of advertising in newspapers and magazines; classified and display advertising; elements of a print advertisement.

Advertising—Broadcast

Characteristics of radio as an advertising medium; segmentation of the listening audience by radio stations; evaluation of electronic media; ratings and shares; advantages of television as an advertising medium.

Direct Marketing

Definition of "direct marketing;" characteristics of consumers who use direct marketing for personal purchases; direct advertising vs. advertising in broadcast and mass print media; various media used in direct marketing; corporate objectives in using direct marketing; characteristics of direct marketing.

Communications Management

Functions of an advertising agency; importance of using an advertising campaign theme; definition of the term "media mix;" advantages of co-op advertising to the manufacturer and retailer; factors to be evaluated in developing a promotional campaign.

Pricing Theories

Definition of "supply" and "demand;" correlation between the supply and the demand curve; elasticity and inelasticity in demand; disposable and discretionary income; definition of the term "equilibrium price;" benefits of multiple-point pricing; break-even concept; marginal cost theory.

Pricing Strategies

Role of price in the marketing mix; product pricing sequence; effects on pricing of the product's position in the product lifecycle; importance of corporate pricing objectives in developing pricing strategies; advantages of high-markup, low volume pricing strategy and high-volume, low mark-up strategy; effects on pricing of competition in undifferentiated products; the learning curve concept; economic justifications for middleman price markups.

International Marketing

Effect of international trade on the U.S. gross national product, role of government in international marketing; concerns in marketing in foreign countries; attitudinal changes necessary for U.S. business people to compete in foreign markets.

Service Marketing

Definition of the term "services;" size of the service market and its effect on the U.S. economy; characteristics of the service products; marketing of non-profit service organizations; problems in product consistency in service products vs. tangible products.

Marketing Management

Effects of the marketing concept on goal-setting by corporations; role of market information in the decision-making process; charting a growth share matrix; function of long-range planning in the marketing-oriented company.

Future Trends

Role of international marketing in the future of the U.S.; consumer's responsibilities in the government-business-consumer relationship; ways in which product shortages will affect marketers; future of transportation systems in the U.S.; future changes in the mass media; impact of computers on the future of marketing.

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PRICE INFORMATION

1. **Video**
   - "Marketing Perspectives" video course (30 programs)
     - — On Foundation-furnished tape in ¾", VHS or BETA $3,200
     - — On customer tape dubbed at customer facility $2,600
   - The video course may be purchased on a 3-year lease/purchase plan for ..... $1,200 per year
   - Broadcast and cable rights are available for a small additional fee.
   - Education consortium or statewide lease or purchase prices will be provided on request.

2. **Print**
   - Textbook: *Principles of Marketing* $20.00
   - Study Guide: *Marketing Perspectives* ..... $ 5.00

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